

# Overview of EPA's Stormwater Rule Considerations

11/14/11

# Urban stormwater is a leading source of water quality impairment

- Urban stormwater identified as source of impairment (2004 WQ Report)
  - 22,559 miles of impaired rivers and streams
  - 701,024 acres of impaired lakes
  - 867 square miles of impaired estuaries
- Stormwater pollutants
  - Sediments, nutrients, metals, temperature, trash, bacteria
  - Cause beach closures and swimming illnesses
  - Impact fisheries and shellfish harvesting
  - Increase the costs of treating drinking water supplies
- Hydrologic impacts
  - Increased stormwater volume can cause flooding, scouring and sewer overflows
  - Reduce groundwater recharge



# The Problem is Getting Worse

- Average Acres Developed Annually
  - 2013-2020: 797,717 acres
  - 2021-2030: 1,086,317 acres
  - 2031-2040: 1,509,386 acres
- Cumulative Acres 2013 – 2040: 32,314,761 acres
- Development increases the amount of impervious cover in the landscape
  - Discharge from 1 acre of impervious cover is **16x** the discharge from a 1 acre of undeveloped land
- Small increases in impervious cover in the watershed leads to big impacts in receiving waters
  - Watersheds with <1-2% of impervious land area = biological impacts to surface waters
  - Watersheds with >5-15% of impervious land area = surface water declines rapidly to degraded levels, loss of function; Loss in base flow in streams and groundwater recharge

# Stormwater Management Must Include Water Quality

## Baseline – Control flooding

- Convey stormwater quickly from site to MS4 system, large detention ponds or directly to waterbody.
- Manage peak flows for flood control, drainage and large scale downstream erosion but not water quality or erosion from frequent rain events.



## Water Quality Approach: Integrate green infrastructure in the design of the project

- Slow down the flow, allow to infiltrate and evapotranspire.
- Reduces pollutant loads to waterbodies.
- View stormwater as a freshwater resource to supplement drinking water supplies and maintain stream flows.
- Reduce local flooding and bring green space into the urban environment.



# Element 1: Retention standard approach for development is necessary and cost effective

- New and redevelopment presents an opportunity for stormwater management practices at sites to be designed in a way that protects water quality.
- Retention Standard for small storms (85<sup>th</sup> – 95<sup>th</sup> percentile) onsite which mimics natural hydrology.
- Standard is achievable, easy to understand & enforceable.
- Recommend lower standard for redevelopment.
- The standards will promote cost effective methods, such as green infrastructure, to protect water quality.
- Voluntary programs with retention standards (LEED and NAHB Green Building Standard) are popular but will not provide enough protection for Nation's waters (spatially and temporally).



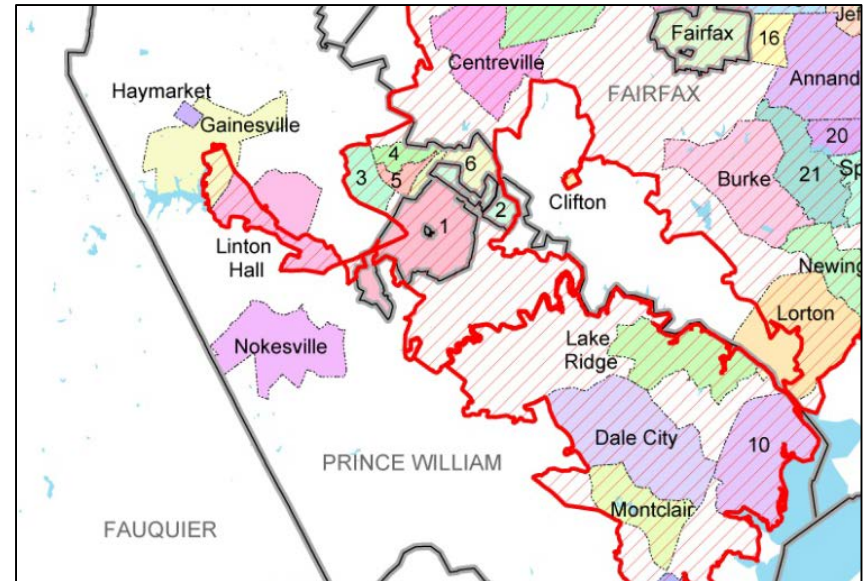
# Flexibilities in the Rule

- Tailored to account for different climatic conditions across the U.S.
- Allows for use of many different tools to fit the site-specific solution to comply with the standard from downspout disconnection and pervious pavement to narrower residential streets and reduced parking lot size.
- Accommodates site constraints and water rights: volume that cannot be retained on site could be managed through treatment, off-site mitigation in the same subwatershed or payment in lieu.
- Allows for delay in implementation for 5- years to allow for code and ordinance changes and efficient site plan approval.
- Allows for a process to be developed to approve existing state retention standards
  - 18 states already have a retention standard to reduce discharge volumes and pollutants loads (80<sup>th</sup> percentile storm and above)



# Create Level Playing Field for Municipalities

- Support from municipalities that the standard should be applied outside regulated MS4s.
- Create a level playing field for developers among municipalities.
- Protect downstream communities from upstream development.



District of Columbia Metro Area Urbanized Area Map US Census 2000 (red hatched)

# Retention Standard Approach is Supported

- 2009 NRC Report: Urban Stormwater Management in the U.S.
  - Current approach is unlikely to adequately control stormwater's contribution to waterbody impairment. A more straightforward way would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading.
- EPA has received a significant amount of feedback through two years of outreach: surveys, 200 comments from 2009 FRN, national listening sessions and site visits, national conferences, monthly meetings with states and regulated MS4s, regular meetings with developers and environmental groups
- Regulated community teamed up with environmental groups to write a letter of support to EPA – WEF, NACWA, ASIWPCA (ACWA), American Rivers, NRDC
  - “Our organizations believe that including new development and redevelopment standards for on-site retention is an important element of the proposed rule and will help to provide much needed reductions in the permanent discharges created by development, both in “greenfield” undeveloped locations and urban infill settings.”
  - “We also believe it is critically important for EPA to include in the rule certain stormwater dischargers located outside of an MS4 that have an impact on water quality. This will address the growing issue of dischargers such as large residential subdivisions or large commercial properties located outside of a regulated MS4 area, but still significantly contributing to water quality issues, creating water quality complications for downstream regulated MS4s and other point sources. Additionally, regulation of such discharges located outside the MS4 will help level the playing field of stormwater controls within and outside urbanized areas, so that the rules cannot be said to tip development decisions toward less protected locations.”



# Costs, Environmental Results and Benefits

- Costs
  - Wide range in cost per acre to implement controls, such as rain garden or pervious pavement, depending on development type (amount of impervious area), rainfall, soils and other conditions.
  - Sites designed with a smaller impervious cover footprint (narrower streets or smaller parking lots) result in cost saving due to a smaller stormwater volume to manage and construction costs savings.
  - Annual national costs are small compared to value of construction industry estimated to be \$1 trillion between 2013 and 2019 and projected to increase in subsequent years.
- Environmental Results
  - Cost per pound removed for total suspended sediment, nitrogen and phosphorus.
  - Reduced channel erosion (not quantified).
- Benefits
  - Water Quality benefits: Improved recreational uses\*, reduced channel erosion, reduced drinking water treatment cost, reduced channel dredging and reservoir siltation.
  - Water Quantity benefits: Reduced flooding\*, increased groundwater recharge\*
  - Other benefits due to increases in vegetation: Improved air quality\*, reduced urban heat island, increased property values, carbon sequestration, reduced energy usage.
- Community Benefits
  - Green jobs - Every infrastructure job creates more than 3 additional jobs to support that position.
  - Spurs investment: \$1 of water and sewer infrastructure investment increases gross domestic product by more than \$6 (U.S. Conference of Mayors).
  - Revitalize downtown areas, especially riverfront areas.

\* Able to monetized for the rule

# Element 2: Municipal Retrofit Plans

## Why require larger cities to reduce existing discharges/retrofit?

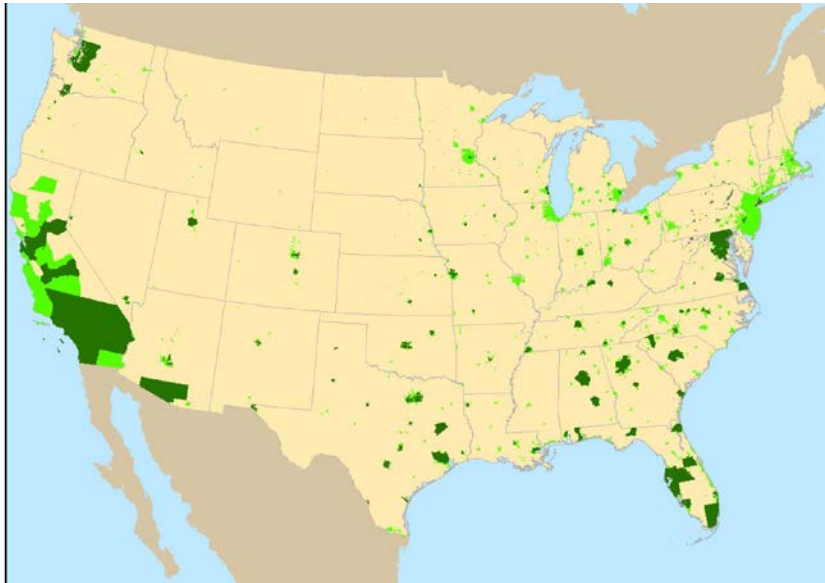
- Address water quality impairments in larger cities
  - 250 regulated MS4s greater than 100,000 in pop.
  - 1250 regulated MS4s greater than 50,000 pop.
- 80% of regulated MS4s with populations >100,000 discharge to impaired waters
- Standard for new development and redevelopment will not be enough to restore urban waters



Requiring MS4s to develop these programs will:

- Allow municipalities to develop programs that identifies long term goals, highest priority projects and milestones.
- Integrate green infrastructure into projects cities are already doing
- Implement program through an iterative approach
- Allow communities to consider stormwater needs with other CWA-related needs and develop holistic plans to restore urban waters
- Complement gains by redevelopment standard
- Spur investment by other parties

# Element 3: Extend Protection of MS4 Program



Map of current coverage (green)

## OPTIONS

1. Urbanized clusters (Census: 1,000 people/mi<sup>2</sup>) would result in **322 new MS4s with population >10,000**
2. Small watersheds (HUC 12) which overlap with urbanized area would result in **84 new MS4s with population >10,000**

## WHY EXTEND PROGRAM?

- 50% of the new MS4s have impaired waters within the city or just outside (<5 km)
- These cities would not be regulated under MS4 program for 10-30 years by urbanized area definition
- MS4 program builds on existing framework of local oversight
- MS4 program requires 6 minimum measures which help prevent contamination
- MS4 program helps ensure standards are properly implemented which could reduce need for expensive retrofits later
- These cities are located in a limited number of states, there will be no impact in 12 states because they already regulate MS4s greater than 10,000<sup>11</sup>

## Element 4: Extending the Protection of the MS4 Program to All Principal Arterial Roads



- Benefits of extending DOT programs
  - Reduced sediment and metals from improved operation and maintenance activities and oversight during construction
  - Reduced salts and chemicals from improved deicing/anti-icing activities, fertilizers and pesticides used in the right of ways
  - Reduced nutrients from pollution prevention practices
  - Reduced volume of stormwater from roads, which account for a high proportion of impervious cover in rural areas
- Rulemaking could extend the MS4 program to the remaining 39% of principal arterials (61% of principal arterials are currently regulated)
- 12 states currently apply the MS4 program to all state-owned roads
  - Arizona, California, DC, Illinois, Michigan, Nevada, New Jersey, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Utah

# Element 5: Extend Protection of Industrial Stormwater Program

- Government-owned maintenance yards
  - 1990 rule included the SIC Code covering maintenance yards
  - Government-owned maintenance yards are listed under a administrative SIC code, which unintentionally excluded them from regulation
  - Rule could propose including these facilities as an industrial discharger to better protect receiving waters
  - This would affect 11,348 facilities

# Appendix



# Residential Cost-Effective Solutions

- Pervious pavement
- Bioswales, raingardens
- Curb cuts, green streets
- Downspout disconnection
- Narrower streets & driveways



# Commercial Cost Effective Solutions

- Curb cuts to use parking islands to infiltrate (integrate into landscape requirements)
- Smaller parking lots
- Pervious pavement





# Commercial Solutions – Parking Lot Islands



*Interior Landscaping.*

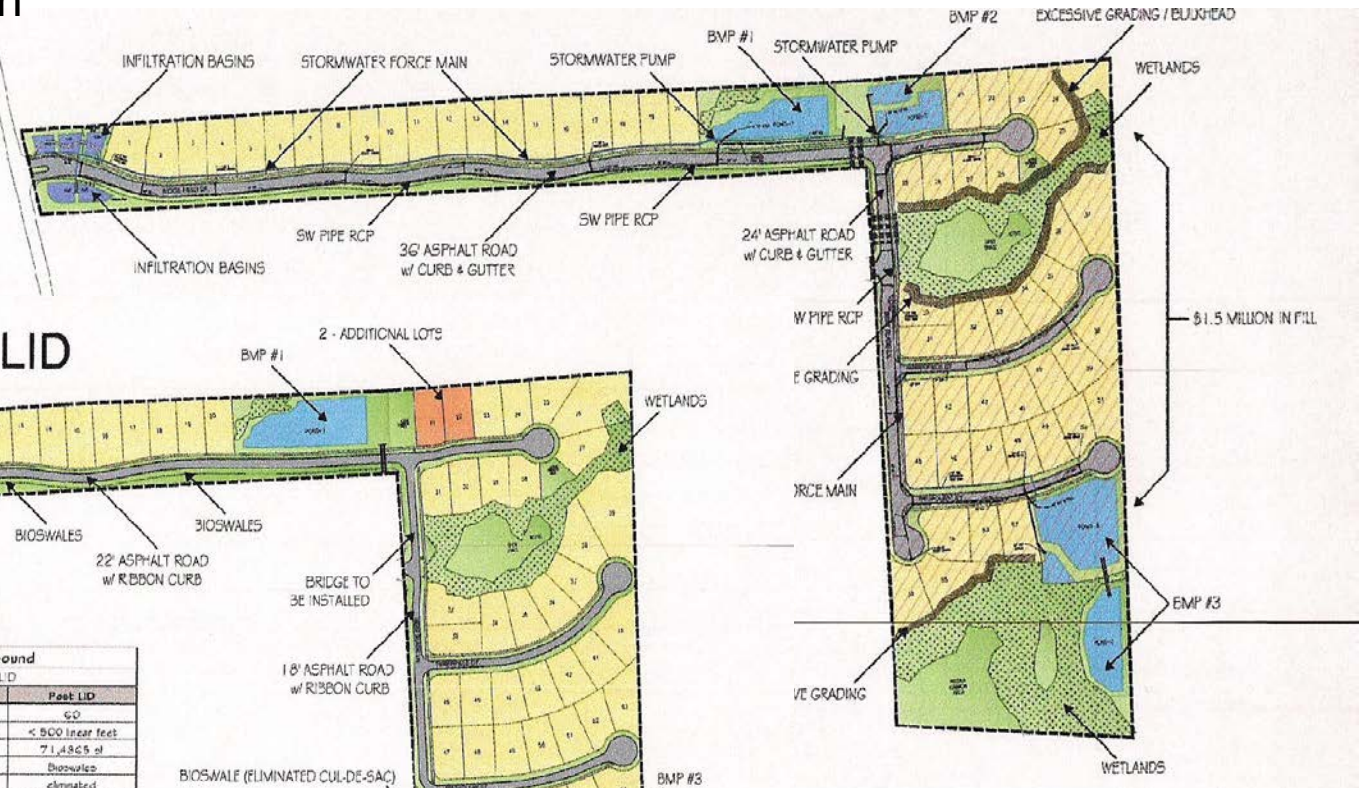


*Stormwater Management Integrated into Interior Landscaping.*

# Developers are realizing smaller detention ponds and gaining extra lot spaces

## Practices: Narrower streets, bioswales

### Conventional Design



Residential Subdivision with  
60 lots on 30 acre site—  
New Hanover, NC



# Boulder Hills, NH

## 14 acres – New Development

### Conventional Site Plan



### Green Infrastructure Site Plan

